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EXAMINER	
ABOAGYE, MICHAEL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/711,786	HENRIKSON, PER	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-34,37 and 39-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-34,37 and 39-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Means-Plus-Function Language

2. A claim limitation will be presumed to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

(A) the claim limitations must use the phrase "means for " or "step for; "

(B) the "means for " or "step for " must be modified by functional language; and

(C) the phrase "means for " or "step for " must not be modified by sufficient structure, material, or acts for achieving the specified function. (MPEP 2181)

Claims 17, 37, and 54 state, "means for reproducing the welding area." This limitation satisfies the 3-prong analysis and therefore ***properly*** invokes 35 U.S.C 112 6th. The means for reproducing is disclosed in the specification as being a camera, such as CCD or CMOS [para 29].

Claims 17, 37, and 54 state "means…for illuminating the welding area with ultraviolet radiation…" This limitation fails to satisfy the 3-prong analysis because the phrase "means for" is modified by sufficient acts for achieving the specified function (i.e. ultraviolet radiation). Therefore, 112 6th paragraph is not invoked.

Claim 17 also states, "computer means." This limitation fails to satisfy the 3-prong analysis because the phrase "means for" is modified by sufficient structure for

achieving the specified function (i.e. computer). Therefore, 112 6th paragraph is not invoked.

Claim 17 also states, "means responsive to said computer means for controlling one of at least one welding parameter and the position of the welding head on the basis of information from the reproduction image." This limitation satisfies the 3-prong analysis and therefore ***properly*** invokes 112 6th paragraph. However, there is insufficient disclosure of the corresponding structure, material or acts for performing the claimed function [para 30, 63]. It is noted that a computer is disclosed in paragraph 63 but this is insufficient for the reasons set forth above in the 112 2nd rejection below. Therefore, since Applicant's specification fails to disclose corresponding structure to limit the means-plus-function, an equivalent is any element that performs the claimed function (MPEP 2185).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 17-19, 37, 51, 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "the reproduction means" in lines 6 and 12.

Claim 37 recites the limitation "the reproduction means" in line 6.

Claim 51 recites the limitation "the reproduction means" in line 1.

Claim 55 recites the limitation "the reproduction means" in line 4. Note, It should be –means for reproducing--, or –reproducing means--.

Claim 18 recites the limitation "said image-processing means" in lines 1-2.

Claim 19 recites the limitation "said image-processing means" in lines 1-2. Note, it should be --said computer means--.

There is insufficient antecedent basis for these limitations in the claims.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, The phrase "means for" or "step for" is used, but the language is unclear because the specification does not disclose sufficient structure, material or acts for performing the claimed function. The specification discloses simply a general purpose computer or microprocessor [para 63], however the corresponding structure for a computer–implemented function must include the algorithm as well as the general purpose computer or microprocessor. The written description of the specification must at least disclose the algorithm that transforms the general purpose microprocessor to a special purpose computer program to perform. Applicant may express the algorithm in any understandable terms including mathematical formula, in prose, in flow chart, or in any other manner that provides sufficient structure. See MPEP 2181.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 17, 18 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maram et al. (US Patent No. 4,767,911) in view of Kovacevic et al. (US Patent No. 5,481,085).

Regarding claim 17, Maram et al. teaches an arrangement (see, figure 1) for real-time control of a welding operation that utilizes a welding head or torch (22, figure 1), said arrangement comprising:

a device for monitoring a welding area of an object (28, figure 1) during welding, said device comprising means for reproducing (CCD 34, figure 1) the welding area;

at least one filter (32, figure 1) arranged in front of or in the reproduction means (34, figure 1); and

means, other than said welding head, for illuminating the welding area (consist of surface (24) and weld pool (26), figure 1) (see light illuminating assembly comprising: collimated light source (10), light modulator (12), optical fiber (16) and focusing lens (18));

wherein said filter comprises a band-pass filter configured for filtering around the predetermined wavelength (column 3, lines 40-45)

computer means (see, the data acquisition system (36) and real time processor (38) of figure 1) for processing a reproduction image of the welding area produced by the reproduction means (34, figure 1); and

means (see, the weld current controller (40), figure 1), responsive to said computer means (9), for controlling one of at least one welding parameter and the position of the welding head (22, figure 1) on the basis of information from the reproduction image (see, Maram et al., column 3, lines 30-68).

Maram et al. teaches illuminating the weld area with a laser light beam (20, figure 1) but fail to teach the laser light being one that emits ultraviolet radiation. However, one reading Maram as a whole would have readily appreciated that while the reference is concerned with the use of laser it is not concerned with the particular spectrum in which the laser emits light (column 3, lines 30-36; column 4, lines 55-56).

Maram et al. fail to specifically teach ultraviolet radiation source for illuminating the welding area.

Kovacevic et al. provides the general teaching of it being known to use a UV laser in this art for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner is not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Maram et al. to use a laser that emits light in the near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld

head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Regarding claim 18, Maram et al. teaches an arrangement including an image-processing means is adapted to measure weld pool dimension which includes the width from the reproduction image (column 2, lines 1-10). The combination of Maram et al. and Kovacevic et al. meet the limitation of claim 18. This claim sets forth function, not structure, and therefore the apparatus need only be capable. See MPEP 2114.

Regarding claim 19, Kovacevic et al. teaches welding two workpieces (w1 and w2, figure1); providing an image means for detecting the length, width, depth, sag or depression and the overall outline of the weld pool (Kovacevic et al. , column 3, lines 20-25). Note the Kovacevic et al. does not used the word gap, however, it is the examiner's position that dimension such the width recited by Kovacevic et al. would also define the gap between the two workpieces at the weld area. The combination of Maram et al. and Kovacevic et al. meet the limitation of claim 19. This claim sets forth function, not structure, and therefore the apparatus need only be capable - cite relevant portion of MPEP.

Regarding claim 20, Maram et al. teaches method for monitoring a welding area of an object (24) during a welding process that utilizes a welding head (20), said method comprising:

during said welding process, illuminating the welding area with light radiation of a predetermined wavelength by means of a source other than said welding head (see, the

light illuminating assembly comprising: collimated light source (10), light modulator (12), optical fiber (16) and focusing lens (18));

using a means (34) for reproduction, reproducing the welding area while it is being welded;

and filtering radiation from the welding area in a direction toward said means (3) for reproduction, said filtering being carried out using a band-pass filter (32) around the predetermined light wavelength (see, Maram et al., column 3, lines 30-68).

Maram et al. teaches illuminating the weld area with a laser light beam (20, figure 1) but fail to teach the laser light being one that emits ultraviolet radiation. However, one reading Maram as a whole would have readily appreciated that while the reference is concerned with the use of laser it is not concerned with the particular spectrum in which the laser emits light (column 3, lines 30-36; column 4, lines 55-56).

Maram et al. fail to specifically teach ultraviolet radiation source for illuminating the welding area.

Kovacevic et al. provides the general teaching of it being known to use a UV laser in this art for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner it not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Maram et al. to use a laser that emits light near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Regarding claims 21-24, Kovacevic et al. teaches said predetermined wave length to be about 337 nm (column 4, line 1). This satisfies the ranges set forth in claims 21-24.

Regarding claims 25-26, Kovacevic et al. teaches said predetermined wave length to be about 337 nm. Though Kovacevic et al. does not teach the exact wavelength recited in these claims , however it has been held that , a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

Regarding claims 31 and 32, Maram et al. teaches processing a reproduction image of the welding area produced by the reproduction means; and controlling at least one of welding parameters and the position of said welding head based on information obtained from the processed reproduction image (see, Maram et al. column 2, lines 29-68).

Regarding claim 33, Maram et al. fails to teach comparing the measured weld width with one or more reference values and, in the event of deviation, making adjustment to the welding parameter to obviate the deviation.

Kovacevic et al. teaches a feedback system included in the control which allows the acquired data by the imaging system to be compared with the reference or predetermined values and effecting the necessary adjustments to enhance the overall weld quality (see, Kovacevic et al. column 3, lines 20-31).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Maram et al. to include feedback system as taught by Kovacevic et al. to be able to adjusted the welding parameters in order to obviate any deviations from predetermined values and thereby enhancing the overall weld quality (see, Kovacevic et al. column 3, lines 20-31).

Regarding claim 34, Maram et al. in figure 2a seem to indicate two workpieces in abutment position fro welding, however Maram et al. is silent about the detecting the geometry of the weld pool.

Kovacevic et al. teaches welding two workpieces (w1 and w2, figure1); providing an image means for detecting the length, width, depth, sag or depression and the overall outline of the weld pool, and controlling at least one of welding parameters and the position of said welding head based on information obtained from the processed reproduction image (Kovacevic et al., column 3, lines 20-31). Note the Kovacevic et al. does not used the word gap, however, it is the examiner's position that dimension such

the width recited by Kovacevic et al. would also define the gap between the two workpieces at the weld area.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Maram et al. to monitor and or detect the geometry of the weld pool as the welding progresses as taught by Kovacevic et al. to enable the welding parameters to be adjusted accordingly and thereby enhancing the overall weld quality (see, Kovacevic et al. column 3, lines 20-31).

Regarding claims 37, 39 and 51, Maram et al. teaches a device for monitoring a welding area of an object (14) during a welding operation that utilizes a welding head, said device comprising:

means, other than the welding head, for illuminating (10, figure 1) the welding area with a monochromatic light having at least one predetermined wavelength;

means for reproducing (34) the welding area; and

at least one filter (32) arranged in front of or in the reproduction means (34), said filter (32) comprising a band-pass filter configured for filtering around said predetermined wavelength;

wherein said means for illuminating and said means for reproducing are positioned generally proximate the welding head during operation thereof (see, figure 1 and abstract, and column 3, lines 30-68).

Maram et al. teaches illuminating the weld area with a laser light beam (20, figure 1) but fail to teach the laser light being one that emits ultraviolet radiation. However, one reading Maram as a whole would have readily appreciated that while the reference is

concerned with the use of laser it is not concerned with the particular spectrum in which the laser emits light (column 3, lines 30-36; column 4, lines 55-56). .

Maram et al. fail to specifically teach ultraviolet radiation source for illuminating the welding area.

Kovacevic et al. provides the general teaching of it being known to use a UV laser in this art for illuminating welding area because at those wavelengths interference from the weld arc and background sources is minimized (column 3, line 62-column 4, line 3). It should also be noted that the examiner is not relying on the entire invention of Kovacevic but only on him being evidence that use of UV laser is known in the art (the benefits of such a laser being independent of the use of a diffuser and grid, as taught by Kovacevic).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Maram et al. to use a laser that emits light near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source which may affect the responses from the weld area is minimized (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Regarding claim 40, Maram et al. teaches a band pass filter centered with the wavelength of the illuminating light source. Maram as modified by Kovacevic et al. teaches illuminating the weld area with in the near-ultraviolet portion. Therefore selecting the band pass filter commensurate with predetermined wave length of ultraviolet light would have been within the purview of one of ordinary skill in the art.

Regarding claims 41-44, Kovacevic et al. teaches said predetermined wave length to be about 337 nm (column 4, line 1). This satisfies the ranges set forth in claims 21-24.

Regarding claims 45-46, Kovacevic et al. teaches said predetermined wave length to be about 337 nm. Though Kovacevic et al. does not teach the exact wavelength recited in these claims, however it has been held that , a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

7. Claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maram et al. (US Patent No. 4,767,911) in view of Kovacevic et al. (US Patent No. 5,481,085) as applied to claim 20 above and further in view of Justice et al. (US Patent No. 4225771).

Maram et al. and Kovacevic et al. combined fail to teach the correspondence between the band-pass-filter and the predetermined wavelength of the ultraviolet light used for illuminating the welding area.

Justice et al. teaches a method and apparatus fro monitoring a welding area by illuminating said welding area with a monochromatic light of predetermined wavelength from a source (10, figure 1); using a means (24, figure 1) for reproduction, reproducing the welding area while it is being welded; and using a narrow band filter (22, figure 1) for

filtering the radiation from the welding area in a direction toward said means (24) for reproduction (see, Justice et al., abstract); wherein band pass filter is selected to match or commensurate with the predetermined wavelength of the illuminating monochromatic light so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).Justice et al. also teaches illuminating the weld area with monochromatic light source of wavelength of about 400-700 Nm and using a narrow band filter adapted for filtering a band width as small as about 10 nm (see, Justice et al. , column 2, lines 29-40). Though Justice et al. does not teach the exact band filter width (i.e. FWHM) recited in these claims, however it has been held that, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

It would have been obvious to one of ordinary skill to one or ordinary skill in the art at the time of the invention to modify the method of Maram et al. and Kovacevic et al. to use band pass filter that matches or commensurate with the predetermined wavelength of the illuminating ultraviolet light as taught by Justice et al. so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).

8. Claims 47-50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maram et al. (US Patent No. 4,767,911) in view of Kovacevic et al. (US Patent No. 5,481,085) as applied to claim 37 above and further in view of Justice et al. (US Patent No. 4225771).

Maram et al. and Kovacevic et al. combined fail to teach the correspondence between the band-pass-filter and the predetermined wavelength of the ultraviolet light used for illuminating the welding area.

Justice et al. teaches a method and apparatus fro monitoring a welding area by illuminating said welding area with a monochromatic light of predetermined wavelength from a source (10, figure 1); using a means (24, figure 1) for reproduction, reproducing the welding area while it is being welded; and using a narrow band filter (22, figure 1) for filtering the radiation from the welding area in a direction toward said means (24) for reproduction (see, Justice et al., abstract); wherein band pass filter is selected to match or commensurate with the predetermined wavelength of the illuminating monochromatic light so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).Justice et al. also teaches illuminating the weld area with monochromatic light source of wavelength of about 400-700 Nm and using a narrow band filter adapted for filtering a band width as small as about 10 nm (see, Justice et al. , column 2, lines 29-40). Though Justice et al. does not teach the exact band filter width (i.e. FWHM) recited in these claims, however it has been held that, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but

are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05. Justice et al. also teaches an attenuating filter (i.e. band pass filter which allow the reflected light or radiation to pass with negligible attenuation) (see, Justice et al. column 2, line 35-40)

It would have been obvious to one of ordinary skill to one or ordinary skill in the art at the time of the invention to modify the method of Maram et al. and Kovacevic et al. to use band pass filter that matches or commensurate with the predetermined wavelength of the illuminating ultraviolet light as taught by Justice et al. so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).

9. Claims 52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maram et al. (US Patent No. 4,767,911) in view of Kovacevic et al. (US Patent No. 5,481,085) as applied to claim 20 above and further in view of Tamada et al. (US Patent No. 4806964).

Regarding claims 52 and 54 the combination of Maram et al. and Kovacevic et al. combined meet the claimed limitations except a camera comprising a diaphragm.

Tamada et al. teaches a camera comprising a diaphragm for controlling the exposure of the object being imaged by the camera and thereby controlling the quality of the image produced (see, Tamada et al., abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Maram et al. and Kovacevic et al. use a camera comprising a diaphragm as taught by Tamada et al. in order to control the exposure of the object being imaged by the camera and consequently control the quality of the image produced (see, Tamada et al., abstract).

10. Claims 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maram et al. (US Patent No. 4,767,911) in view of Kovacevic et al. (US Patent No. 5,481,085) as applied to claim 20 above and further in view of Justice et al. (US Patent No. 4225771).

Maram et al. teaches device and a method (see, figure 1) for real-time control of a welding operation that utilizes a welding head or torch (22, figure 1), said arrangement comprising: a device for monitoring a welding area of an object (28, figure 1) during welding, said device comprising means for reproducing (34, figure 1) the welding area; at least one filter (32, figure 1) arranged in front of or in the reproduction means (34, figure 1); and means other than said welding head for illuminating the welding area (consist of surface (24) and weld pool (26), figure 1) (see, the light illuminating assembly comprising: collimated light source (10), light modulator (12), optical fiber (16) and focusing lens (18)); wherein said filter comprises a band-pass filter configured for filtering around the predetermined wavelength; computer means (see, the data acquisition system (36) and real time processor (38) of figure 1) for processing a reproduction image of the welding area produced by the reproduction means (34, figure

1); and means (see, the weld current controller (40), figure 1), responsive to said computer means (9), for controlling one of at least one welding parameter and the position of the welding head (22, figure 1) on the basis of information from the reproduction image (see, Maram et al., column 3, lines 30-68).

Maram et al. teaches illuminating the weld area with a light beam (20, figure 1) but fail to teach illuminating with ultraviolet radiation.

Kovacevic et al. teaches a device (10, figure 1) and a method for a real time control of a welding operation. Said arrangement and method comprising: providing a weld head (see, the arc welding head shown in figure 1); and means other than said welding head for illuminating the welding area (see, 14, figure 1); a device (22, figure 1) which includes an imaging means in a form of a high speed shutter camera for monitoring a welding area of an object; wherein said camera functions by detecting reflected radiation or light from the weld pool (see, the weld pool S, figure 1, and column 5, lines 49-67). Kovacevic et al. also points out that illuminating with light source in the near-ultraviolet portion of the optical spectrum is preferred since at said optical wavelength range interference from the weld head and back-ground source is fairly minimal (see, Kovacevic et al., column 3, line 62-column 4, line 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the arrangement of Maram et al. to use near-ultraviolet wavelength range to illuminate and monitor the weld area as taught by Kovacevic et al. since within said optical wavelength range, interference from the weld head and back-ground source

which may affect the responses from the weld area is fairly minimal (see, Kovacevic et al., column 3, line 62-column 4, line 3).

Maram et al. and Kovacevic et al. combined fail to teach the correspondence between the band-pass-filter and the predetermined wavelength of the ultraviolet light used for illuminating the welding area.

Justice et al. teaches a method and apparatus for monitoring a welding area by illuminating said welding area with a monochromatic light of predetermined wavelength from a source (10, figure 1); using a means (24, figure 1) for reproduction, reproducing the welding area while it is being welded; and using a narrow band filter (22, figure 1) for filtering the radiation from the welding area in a direction toward said means (24) for reproduction (see, Justice et al., abstract); wherein band pass filter is selected to match or commensurate with the predetermined wavelength of the illuminating monochromatic light so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).Justice et al. also teaches illuminating the weld area with monochromatic light source of wavelength of about 400-700 Nm and using a narrow band filter adapted for filtering a band width as small as about 10 nm (see, Justice et al. , column 2, lines 29-40). Though Justice et al. does not teach the exact band filter width (i.e. FWHM) recited in these claims, however it has been held that, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same

properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), See MPEP 2144.05.

It would have been obvious to one of ordinary skill to one or ordinary skill in the art at the time of the invention to modify the method of Maram et al. and Kovacevic et al. to use band pass filter that matches or commensurate with the predetermined wavelength of the illuminating ultraviolet light as taught by Justice et al. so that the reflected monochromatic radiation from the weld area will pass through the band pass filter to the reproducing means with negligible attenuation (see, Justice et al., column 2, lines 15-50).

Response to Arguments

11. The examiner acknowledges the applicants' amendment received by USPTO on November 05, 2008. Claims 17-34, 37 and 39-56 are currently under consideration in the application.

12. Applicant's arguments with respect to claim17-34, 37 and 39-56 have been considered but are moot in view of the new ground(s) of rejection. The applicant's argument regarding the combination of Kovacevic et al. and Sheaffer et al. have been noted, however said combination is no longer applicable in the instant rejections, and that applicant's argument that Kovacevic actually teaches away from such a modification is moot and no longer valid. The reference to Kovacevic et al. is still used in the instant rejections but for a different reason than indicated in the previous office

action. Kovacevic et al. provides a general teaching that ultraviolet laser is known in the art as preferred for illuminating welding since at said optical wavelength range interference from the weld head and back-ground source is fairly minimal (see, Kovacevic et al., column 3, line 62-column 4, line 3). Kovacevic et al. therefore remedies Maram et al. for failing to teach ultraviolet radiation fro illuminating the welding area.

It should also be noted that the examiner does not relying on the entire invention of Kovacevic but only as a general teaching of using ultraviolet laser for illuminating and imaging of the welding area - the benefits of such a laser being independent of the use of a diffuser and grid. One of ordinary skill in the art trying modify the apparatus of Maram et al. to obtain an enhance images of the welding area (i.e. sharpness and good contrast) will look to Kovacevic et al. since by using near-ultraviolet portion of the optical spectrum interference from the weld head and back-ground source which has the potential of blurring the images is fairly minimal.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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